IN THE CLAIMS

1. (Currently Amended) A computer implemented method, comprising:

maintaining on a single network element of a backbone provided by a network provider a plurality of contexts, each corresponding to a customer accessing the backbone, each context having sufficient information to establish a network connection for the corresponding customer to access other network elements of the backbone, wherein the plurality of contexts includes a first context for a first customer ~~separately from~~ and a second context for a second customer different than the first customer, wherein the first and second contexts enable isolation of traffic processed between the first and second customers ~~and provide the ability to give access to a given customer's information while restricting access to other information~~ in the single network element;

~~providing~~ establishing a layer 3 VPN (virtual private network) to the first customer based upon information maintained within the first context without using information of the second context; and

~~providing~~ establishing a non-VPN access to a backbone to a second customer based upon information maintained within the second context without using information of the first context.

2. (Currently Amended) The method of claim 1 wherein

the first context includes configuration information for the layer 3 VPN and

the second context includes configuration information for the second customer.

3. (Previously Presented) The method of claim 1 wherein

the first context includes routing information for the layer 3 VPN and

the second context includes routing information for the second customer.

4. (Currently Amended) The method of claim 1 further comprising maintaining on the single network element a set of non-VPN related information for the first customer.

5. (Previously Presented) The method of claim 1 further comprising:

providing a second layer 3 VPN to a third customer;

maintaining on the single network element a third context for the second layer 3 VPN and

maintaining a single exterior gateway protocol process table for the first layer 3 VPN and the second layer 3 VPN.

6. (Currently Amended) A computer implemented method comprising:

maintaining a first set of information for a first layer 3 VPN (virtual private network), the first set of information for including a first value identifying the first layer 3 VPN;

separately maintaining a second set of information for a second layer 3 VPN, the second set of information for including a second value identifying the second layer 3 VPN, wherein the first and second sets of information corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;

associating the first value with a first route distinguisher;

associating the second value with a second route distinguisher; and

maintaining a single EGP (exterior gateway protocol) table for the first and second layer 3 VPNs.

7. (Original) The computer implemented method of claim 6 further comprising:

separately maintaining a third set of information for a non-VPN customer, the third set of information for including a third value identifying the non-VPN customer; and

maintaining a second EGP table for the non-VPN customer.

8. (Original) The computer implemented method of claim 6 further comprising:

maintaining a first routing table for the first layer 3 VPN;

maintaining a second routing table for the second layer 3 VPN;

updating a set entries for the first layer 3 VPN in the single EGP table, each of the set of entries indicating the first route distinguisher;

mapping the first route distinguisher to the first value; and

indicating the mapped first value in communication about the updated set of entries.

9. (Original) The computer implemented method of claim 6 further comprising:

maintaining a data structure for the single EGP table, the data structure indicating the association between first value and the first route distinguisher and between the second value and the second route distinguisher; and

performing mappings between the first value and the first route distinguisher and between the second value and the second route distinguisher with the data structure.

10-22 (Canceled)

23. (Currently Amended) A machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

maintaining a set of information for a first layer 3 VPN (virtual private network), the first set of information for including a first value identifying the first layer 3 VPN;

separately maintaining a second set of information for a second layer 3 VPN, the second set of information for including a second value identifying the second layer 3 VPN, wherein the first and second sets of information corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;

associating the first value with a RD (first route distinguisher);

associating the second value with a second RD;

maintaining a data structure to perform mappings between the first value and the first RD and between the second value and the second RD; and

maintaining a single exterior EGP (gateway protocol) table for the first and second layer 3 VPNs.

24. (Original) The machine-readable medium of claim 23 further comprising:

separately maintaining a third set of information for a non-VPN customer, the third set of information for including a third value identifying the non-VPN customer; and

maintaining a second EGP table for the non-VPN customer.

25. (Original) The machine-readable medium of claim 23 wherein the mappings are performed for communications about the single EGP table.

26. (Currently Amended) A machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

maintaining on a single network element of a backbone provided by a network provider a plurality of contexts, each corresponding to a customer accessing the backbone, each context having sufficient information to establish a network connection for the corresponding customer to access other network elements of the backbone, wherein the plurality of contexts includes a first context for a first customer and a second context for a second customer different than the first customer, wherein the first and second contexts enable isolation of traffic processed between the first and second customers in the single network element;

establishing a layer 3 VPN (virtual private network) to the first customer based upon information maintained within the first context without using information of the second context; and

establishing a non-VPN access to a backbone to a second customer based upon information maintained within the second context without using information of the first context.

~~storing a first set of configuration information for a non-VPN (virtual private network) customer;~~

~~storing a second set of configuration information for a first layer 3 VPN, the second set of configuration information including a first value identifying the first layer 3 VPN;~~

~~associating the first value with a first RD (route distinguisher);~~

~~storing a third set of configuration information for a second layer 3 VPN, the third set of configuration information including a second value identifying the second layer 3 VPN;~~

~~associating the second value with a second RD;~~

~~creating a first EGP (exterior gateway protocol) table and a first routing table for the non-VPN customer;~~

~~creating a second EGP table for the first and the second layer 3 VPNs;~~

~~creating a second routing table for the first layer 3 VPN and a third routing table for the second layer 3 VPN;~~

~~mapping between the first value and the first RD to communicate modifications and to service requests for a set of entries in the second EGP table, the set of entries corresponding to the first layer 3 VPN.~~

27. (Currently Amended) The machine-readable medium of claim 26 ~~further comprising~~wherein

the first context includes configuration information for the layer 3 VPN and

the second context includes configuration information for the second customer.

~~mapping between the second value and the second RD to communicate modifications and to service requests for a second set of entries in the second EGP table, the second set of entries corresponding to the second layer 3 VPN.~~

28. (Currently Amended) The machine-readable medium of claim 26 wherein ~~each of the set of entries in the second EGP table indicate the first RD.~~

the first context includes routing information for the layer 3 VPN and

the second context includes routing information for the second customer.

29. (Currently Amended) The machine-readable medium of claim 26 ~~wherein the non-VPN customer and a customer provided the first layer 3 VPN are the same entity.~~further comprising:

providing a second layer 3 VPN to a third customer;

maintaining on the single network element a third context for the second layer 3 VPN and

maintaining a single exterior gateway protocol process table for the first layer 3 VPN and the second layer 3 VPN.

30. (Currently Amended) A machine-readable medium that provides instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

maintaining a first set of information for a first layer 3 VPN (virtual private network), the set of information for including a first value identifying the first layer 3 VPN;

separately maintaining a second set of information for a second layer 3 VPN, the second set of information including a second value identifying the second layer 3 VPN, wherein the first and second sets of information corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;

associating the first value with a first route distinguisher;

associating the second value with a second route distinguisher; and

maintaining a single EGP (exterior gateway protocol) table for the first and second layer 3 VPNs.

31. (Original) The machine-readable medium of claim 30 further comprising:

separately maintaining a third set of information for a non-VPN customer, the third set of information including a third value identifying the non-VPN customer; and

maintaining a second EGP table for the non-VPN customer.

32. (Original) The machine-readable medium of claim 30 further comprising:

maintaining a first routing table for the first layer 3 VPN;

maintaining a second routing table for the second layer 3 VPN;

updating a set entries for the first layer 3 VPN in the single EGP table, each of the set of entries indicating the first route distinguisher;

mapping the first route distinguisher to the first value; and

indicating the mapped first value in communication about the updated set of entries.

33. (Original) The machine-readable medium of claim 30 further comprising:

maintaining a data structure for the single EGP table, the data structure indicating the association between first value and the first route distinguisher and between the second value and the second route distinguisher; and

performing mappings between the first value and the first route distinguisher and between the second value and the second route distinguisher with the data structure.